19. (Amended) The apparatus of claim 16 further comprising means for marking a point on the first map, the point on the first map being automatically reproduced on the second map.

A15

20. (Amended) The apparatus of claim 16 further comprising means for providing a longitude and latitude to the point on the first map.

REMARKS

This is in reply to the Examiner's Official Action dated October 23, 2002. Claims 1-20[1] are currently pending. By this Amendment, the specification, and claims 1-6, 9, 11, 12, 15-17, 19 and 20 have been amended, and claims 7, 13 and 18 have been cancelled to more appropriately describe and claim the invention. The above amendment with the following remarks are submitted to be fully responsive to the Official Action. Reconsideration of this application in light of these remarks, and allowance of this application are respectfully requested.

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[1] The PTO 326 incorrectly indicates that claims 1-19 are pending.

I. Specification

On page 2 of the Official Action, the Examiner objected to the Abstract and Title of the disclosure because they "are duplicated (sic) of abstract and title of application 09/537[,]849, 09/821[,]638 and 09/537[,]849. According to the Manual for Patent Examining Procedures (MPEP), "where the title is not descriptive of the invention claimed, the examiner should require substitution of a new title that is clearly indicative of the invention to which the claims are directed." MPEP at § 606.01. With respect to abstracts, the MPEP later provides that:

> [t]he content of a patent abstract should be such as to enable the reader thereof, regardless of his or her familiarity with patent documents to ascertain quickly the character of the subject matter covered by the technical disclosure and should include that which is new in the art to which the invention pertains.

(Id. at 606.01(b).) Neither section of the MPEP requires amendment of the title or abstract simply because they are duplicative of a title and/or abstract in another application. Applicants respectfully assert that as required by the MPEP, the title is descriptive of the invention as claimed, and the abstract enables a reader to ascertain the character of the subject matter covered by the technical disclosure and generally includes that which is new in the art to which the invention pertains. Therefore, Applicants request that the Examiner reconsider and withdraw his objection to the title and abstract.

Applicants have corrected minor grammatical errors in the specification.

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II. Rejection of Claims Under 35 U.S.C. § 112

On page 10 of the Official Action, the Examiner rejected claims 1, 11, and 16 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. According to the Examiner, the limitation "approximately" in claims 1, 11 and 16 lacks sufficient antecedent basis. Applicants submit that the term "approximately" as used in claims 1, 11, and 16 does not require antecedent basis. Nevertheless, in order to more appropriately claim their invention, Applicants have amended claims 1, 11 and 16 to remove the objectionable limitation. Reconsideration of the rejection of claims 1, 11 and 16 is therefore respectfully requested.

III. Rejection of Claims Under 35 U.S.C. § 102(b)

On page 2 of the Official Action, the Examiner rejected claim 1 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,487,139 to Saylor et al. (hereinafter, Saylor). According to the Examiner, Saylor teaches:

> receiving a display of a first map and a second map, the first map being a digital raster map, the second map being a previously georeferenced map; . . . receiving a manipulation of the first map such that the first map and the second map are approximately aligned; . . . displaying the first map and the second map; . . . receiving a selection of a point pair point on the first map; . . . receiving a selection of a corresponding point pair point on the second map.

(Official Action of October 23, 2002 at pages 2 and 3.) (Emphasis added.) The Examiner rejected claims 11 and 16 for reasons identical to those set forth in rejecting claim 1. Applicants disagree with the Examiner's characterization of the prior art, and therefore traverse the Examiner's rejection of claims 1, 11 and 16. More specifically, Applicants disagree that Saylor discloses, teaches or suggests the capability to receive

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a selection of a point pair point on a first map, and to receive a selection of a corresponding point pair point on a second map. Consistent with the present invention, a user performs this step by locating a common geographic feature on a first and a second map, and then marking each of them as a unique point pair. According to the Examiner, Saylor teaches this limitation by disclosing the process of "saving the raster map and the X, Y object database coordinates in a database for subsequent selective display." (Id. at page 3.) A careful reading of the portion of Saylor cited by the Examiner reveals that it simply discloses the process of saving a raster map, and X, Y coordinates that identify locations of addresses within the territory depicted by the raster map in a database. Neither this disclosure, nor any other in Saylor teaches or suggests the capability of the device to receive a selection of a point pair point on a first map, and to receive a selection of a corresponding point pair point on a second map.

Anticipation under 35 U.S.C. §102(b) requires that each and every claim limitation be disclosed by the applied reference. Saylor does not teach each and every claim limitation of claims 1-20 and therefore, as a matter of law, cannot anticipate these claims. That is, Saylor does not teach: receiving a selection of a point pair point on the first map; and receiving a selection of a corresponding point pair point on the second map, as recited in the as-filed claims.

Even though the cited reference fails to reach the teachings of Applicants' device, Applicants have nevertheless amended claims 1-6, 9, 11, 12, 15-17, 19 and 20 to broaden the scope of the previous claims, overcome the Examiners objections, and more appropriately describe Applicants' invention. Applicants contend that the claims as amended, still patentably distinguish over the prior art. Therefore, the rejection of

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independent claims 1, 11 and 16 under 35 U.S.C. §102(b) as anticipated by Saylor should be withdrawn. The rejection of dependent claims 2-6, 8-10, 12, 14, 15, 17, 19 and 20 should also be withdrawn as they depend on allowable subject matter as recited in the respective independent claims from which they directly or indirectly depend.

In view of the foregoing, it is submitted that the cited prior art fails to teach or suggest the Applicant's claimed invention. Applicants respectfully assert that the present application is in condition for allowance and request a notice to that effect.

Attached hereto is a marked-up version of the changes made to the claims by this amendment. The attached page is captioned "**Version with markings to show changes made**." Deletions appear as normal text surrounded by [ ] and additions appear as underlined text.

If any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this response, and not requested by attachment, such extension is hereby requested. If there are any fees due under 37 C.F.R. § 1.16 or 1.17 that are not enclosed, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge those fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: February 24, 2003

By: _____
Leonard Smith
Reg. No. 45,118

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please amend the third full paragraph on page 2 of the specification to read as follows:

> Also because vector maps are commonly drawn from a geographic data set describing the area shown, they are very easily, and generally inherently, georeferenced. Georeferencing is the process of relating source coordinates to referenced geographic coordinates[.], which are typically in standard latitude/longitude. An image or a vector file is georeferenced to be used within a mapping/geographic environment. In a vector map, the data from which the map is drawn will typically already include a geographic coordinate set.

Please amend the second full paragraph on page 10 of the specification to read as follows:

> When four or more georeferencing point-pairs are determined, the general linear georeferencing functions are over-determined. This means that more than the required amount of information to compute the general linear georeferencing functions is available, but that it is not, in general, completely consistent. The system [use] uses the extra information contained in the additional georeferencing points to provide validation checks to protect against the possibility that some of the data points may

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be inaccurate **(step 430)**. Points that deviate excessively with respect to a calculated standard error are presumed to be inaccurate and are omitted from the calculation of the georeferencing functions. Note that as new [point] points are added, the system also rechecks points previously marked as inconsistent, to determine if those points should now be considered when recomputing the georeferencing functions.

Please amend the first and second full paragraphs on page 11 of the specification to read as follows:

The user may then proceed [o] to enter the next point-pair **(step 440)**[ ]. When the user is finished, the system stores the active georeferencing functions with the raster-map **(step [is]445)**. At this time, the raster map is considered fully georeferenced. When accessed at any future time, the system may simply retrieve the georeferencing functions, and apply them to find the latitude and longitude of any point on the raster map.

The process of determining [he] the georeferencing function set from a set of point-pairs is believed to be within the ability of one of ordinary skill in the art. The specific approach used by the system [an] and method of the preferred embodiment is discussed below.

Please amend the fourth paragraph on page 11 of the specification to read as follows:

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Once determined, $\hat{f}$ will [b] be the georeferencing function which is used to compute corresponding latitude and longitude values[,] (Lon, Lat) for any point[,] (x, y) on the bitmap. There are any number of possible ways to define the function that "comes closest to making (1) true." We shall follow a "least squares" approach also known in mathematics as an L_2 approach. This approach seeks to find the function, $\hat{f}$, which minimizes the sum of the squared differences between the actual and the predicted values of latitude and longitude. In other words, from among all the functions $f \in$ F, $\hat{f}$ is the one which minimizes:

Please amend the first full paragraph on page 12 of the specification to read as follows:

Among various alternative methods for choosing the function $\hat{f}$ are choosing it so [t ht] that it minimizes the sum of absolute errors (rather than squared errors), or so that it minimizes the largest error. Other criteria are also possible.

Please amend the last paragraph on page 13 of the specification to read as follows:

These systems can be easily [solve] solved by well-known methods, such as Gaussian Elimination[,] or LU factorization. The solutions yield the desired values of $\hat{a}_{11}$, $\hat{a}_{12}$, $\hat{a}_{21}$, $\hat{a}_{22}$, $\hat{b}_1$, and $\hat{b}_2$. It should be noted that equations (5a) and (5b) do not have a unique solution

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unless three or more non-collinear points are contained in A. Generally speaking, then, it requires 3 points to choose a georeferencing function from the family of general linear transformations. When there are four points or more, it is possible to compute a standard deviation of errors using the formula:

Please amend the first and second paragraphs on page 16 of the specification to read as follows:

These systems can <u>be</u> easily solved by well-known methods, such as Gaussian Elimination[,] or LU factorization. The solutions yield the [desire] <u>desired</u> values of $\hat{\beta}_1$, $[\hat{\beta}_1]\underline{\hat{\beta}_2}$, $[\hat{\beta}_1]\underline{\hat{\beta}_3}$, and $[\hat{\beta}_1]\underline{\hat{\beta}_4}$, which in turn yield the desired values for $\hat{a}_{11}$, $\hat{a}_{12}$, $\hat{a}_{21}$, $\hat{a}_{22}$, $\hat{b}_1$, and $\hat{b}_2$.

It should be noted that equation (8) does not have a unique solution unless two or [m re] <u>more</u> points are contained in A. Generally speaking, then it requires two points to determine a georeferencing function from the family of rotational linear transformations. When there are three points or more, it is possible to compute a standard deviation of error, s using the formula:

Please amend the second paragraph on page 17 of the specification to read as follows:

Automatic Error Detection and Handling

When individual points are being assigned x, y, Lon, and Lat values, there is always a potential for error. To reduce the risk of incorrect

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georeferencing resulting from such errors, certain error handling procedures are built into the georeferencing process. The fundamental concept is that of detecting a "bad" point and then removing it from the set of active points, A. Note that removing a bad point from A will not delete the information [associate,] associated with that point, but it will cause the georeferencing parameters to be completely uninfluenced by that point. We [o] do not wish to remove the point entirely, since it may be determined at a later stage of the georeferencing, that the point was not really bad at all, and should be[-] used in the georeferencing calculation. This will be clarified shortly.

Please amend the second full paragraph on page 18 of the specification to read as follows:

There are several things to note about this procedure. One is that [it]allowing the [value] values of c_1 and c_2 to change with the number of active points, makes it possible for the georeferencing system and method to utilize points which it might originally determine bad or inconsistent after a large enough sample of points has been gathered to make it clear that a lesser level of accuracy is all that can be achieved on this map. Another observation is that by using this procedure it is impossible to reduce the number of active points down to less than four (unless you started with less than 4 in which case this procedure does not apply at all). This scheme means that as each new point is added, all points determined so far are considered, even those [which] that had previously been marked

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bad. Thus early "misjudgments" on the part of the system can be corrected later, in light of new point information.

Please amend the last paragraph on page 19 of the specification to read as follows:

A specific example of the operation and application of the preferred georeferencing method may be shown with reference to the "Flood Zone Determination" business. The Federal Emergency Management Agency (FEMA) publishes a library of tens of thousands of paper maps showing various types of flood zones and their locations in the United States. A flood zone determination on a property is frequently done in the following way:

1. The address of the property is examined, and the location of the property is determined (perhaps through the use of a geocoding system, or [b] by examining an available street map).

2. A map analyst attempts to determine which of the many thousands of FEMA flood maps will contain this property.

3. The map analyst goes to a map storage area and retrieves the desired map, often examining several maps before making a final selection.

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4. Having retrieved the paper map, the map analyst next determines where, precisely, the property is located on the map.

5. Finally, the map analyst examines flood zone notations on the map at the property's location in order to determine its flood-zone status.

Please amend the last paragraph on page 20 of the specification to read as follows:

Using georeferenced flood map raster images, steps 2 and 4 above, are replaced by:

2. A computer system combines the pre-designated outlines of the raster map and the georeferencing information to obtain a polygon expressed in terms of latitude and longitude that outlines the region included in each flood map. Then the system determines which of the polygons contain the address in question, which is done using a "point-in-polygon" algorithm. At the conclusion of this process, the computer system has identified a map panel (or perhaps a small number of map panels) that contains the address.

4. Since the latitude and longitude of the property are known (by virtue of a geocoding phase), the computer system can use the georeferencing of the map panels to locate the property on each of the panels found above, thus largely eliminating any need

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for [he] the map analyst to scan the flood map for the address location.

IN THE CLAIMS:

Please amend claims 1-6, 9, 11, 12, 15-17, 19 and 20 as follows:

1. (Amended) A method of georeferencing a raster map, comprising:

[receiving a display of] displaying a first map in one area of a display, said first map being a digital raster map; [and]

displaying a second map in a second area of the display[, the first map being a digital raster map], the second map being a [previously] georeferenced map that displays at least a portion of an identical geographic region displayed in the raster map;

[receiving a manipulation of the first map such that the first map and the second map are approximately aligned;

displaying the first map and the second map;]

selecting at least two points [receiving a selection of a point pair point] on the first map; and

selecting at least two points [receiving a selection of a corresponding point pair point] on the second map, wherein each point selected on the second map corresponds to a point selected on the first map; and

assigning a geographic coordinate associated with each selected point on the second map to each corresponding point on the first map.

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2. (Amended) The method of claim 1 further comprising receiving a verification that [the point pair] a point selected on the first map is correctly associated with the corresponding point [pair point] selected on the second map.

3. (Amended) The method of claim 1 wherein [receiving a manipulation places]the first map[within] is a portion of the second map.

4. (Amended) The method of claim 1 further comprising providing a longitude and latitude to the point [pair point] on the second map.

5. (Amended) The method of claim 1 wherein the point [pair point]on the second map has a known longitude and latitude.

6. (Amended) The method of claim 1 further generating a georeferencing function to output a geographic coordinate for each successive point selected on the first map.

9. (Amended) The method of claim 8 further comprising receiving a correction of the reproduced [mark] point.

11. (Amended) A computer readable medium [whose contents transform a computer system into a raster map georeferencing system, by] containing instructions executable by a computer to georeference a raster map, the method comprising:

[receiving a display of] displaying a first map in one area of a display, said first map being a digital raster map; [and]

displaying a second map in a second area of the display,[the first map being a digital raster map], the second map being a [previously] georeferenced map that displays at least a portion of an identical geographic region displayed in the raster map;

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[receiving a manipulation of the first map such that the first map and the second map are approximately aligned;

displaying the first map and the second map;]

selecting at least two points [receiving a selection of a point pair point] on the first map; and

selecting at least two points [receiving a selection of a corresponding point pair point] on the second map, wherein each point selected on the second map corresponds to a point selected on the first map; and

assigning a geographic coordinate associated with each selected point on the second map to each corresponding point on the first map.

12. (Amended) The computer readable medium of claim 11 wherein the contents of the computer-readable medium are also capable of verifying that the point [pair point]on the first map is correctly associated with the point [pair point]on the second map.

15. (Amended) The computer readable medium of claim 11, wherein the contents of the computer-readable medium are also capable of providing a longitude and latitude to the point [pair point]on the second map.

16. (Amended) [A computer memory containing a data structure capable of enabling the georeferencing of a raster map, the data structure changing a general computing platform into a specific computing machine, by] An apparatus for georeferencing a raster map, comprising:

[receiving a display of] means for displaying a first map in one area of a display, said first map being a digital raster map; [and]

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means for displaying a second map in a second area of the display,[the first map being a digital raster map,] the second map being a [previously] georeferenced map that displays at least a portion of an identical geographic region displayed in the raster map;

[receiving a manipulation of the first map such that the first map and the second map are approximately aligned;

displaying the first map and the second map;]

means for selecting at least two points [receiving a selection of a point pair point] on the first map; and

means for selecting at least two points [receiving a selection of a corresponding point pair point] on the second map, wherein each point selected on the second map corresponds to a point selected on the first map; and

means for assigning a geographic coordinate associated with each selected point on the second map to each corresponding point on the first map.

17. (Amended) The [computer memory] apparatus of claim 16 [wherein the data structure] further comprising means for [verifies] verifying that the point [pair point]on the first map is correctly associated with the point [pair point]on the second map.

19. (Amended) The [computer memory] apparatus of claim 16 [wherein the data structure] further comprising means for [marks] marking a point on the first map, the point on the first map being automatically reproduced on the second map.

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20. (Amended) The [computer memory] apparatus of claim 16 [wherein the data structure] further comprising means for [provides] providing a longitude and latitude to the point [pair point] on the [second] first map.

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